

## CLAIMS

We claim:

1. An electronic identification system including:
  - an interrogator for transmitting a radio frequency interrogation signal;
  - a plurality of radio frequency transponders;
  - each transponder being operative in response to the interrogation signal to respond with a forward error correctable data message including transponder identifying base data encoded as first symbol characters in accordance with a forward error correcting code and first check characters on the transponder identifying base data as defined in the forward error correcting code, and other base data encoded as second symbol characters in accordance with the forward error correcting code and second check characters on the other base data as defined in the forward error correcting code; the first and second check characters for facilitating reconstruction of the transponder identifying base data and other base data in the event of corruption of the forward error correctable data message during transmission; and
  - the interrogator including
    - receiver means for receiving the forward error correctable data message; and
    - data processor means programmed to utilize data relating to the forward error correcting code, the first and second symbol characters and the first and second check characters in the received forward error correctable data message, to reconstruct the transponder identifying base data in the event of corruption of the received forward error correctable data message.
2. An electronic identification system as claimed in claim 1 wherein the forward error correcting code is a member of the class of trellis codes.

3. An electronic identification system as claimed in claim 2 wherein the forward error correcting code is a member of the class of convolutional codes.
4. An electronic identification system as claimed in claim 1 wherein the forward error correcting code is a member of the class of linear block codes.
5. An electronic identification system as claimed in claim 4 wherein the forward error correcting code is a Hamming Code.
6. An electronic identification system as claimed in claim 4 wherein the forward error correcting code is a Binary Golay Code.
7. An electronic identification system as claimed in claim 4 wherein the forward error correcting code is a Reed-Muller Code.
8. An electronic identification system as claimed in claim 1 wherein the forward error correcting code is a member of the class of cyclic block codes.
9. An electronic identification system as claimed in claim 8 wherein the forward error correcting code is a Fire Code.
10. An electronic identification system as claimed in claim 8 wherein the forward error correcting code is a Bose-Chaudhuri-Hocquenghem Code.
11. An electronic identification system as claimed in claim 8 wherein the forward error correcting code is a Reed-Solomon Code.
12. An electronic identification system as claimed in claim 1 including a code generator

means for generating the forward error correctable data message by encoding the transponder identifying base data and other base data as first and second symbol characters in accordance with the forward error correcting code and for generating the first and second check characters on the transponder identifying base data and other base data as defined in the forward error correcting code, the code generator means being separate from the transponders; and wherein each transponder includes: a data memory arrangement into which the forward error correctable data message generated by the code generator means is pre-programmable to be stored therein; and control circuitry for causing the transponder to respond with the stored forward error correctable data message in response to the interrogation signal.

13. An electronic identification system as claimed in claim 12 wherein the code generator means forms part of the interrogator.

14. An electronic identification system as claimed in claim 1 wherein each transponder includes: a data memory arrangement configured to be programmed with the transponder identifying base data and other base data for storage therein; and local code generator means forming part of the transponder for locally generating the forward error correctable data message by encoding the transponder identifying base data and other base data as the first and the second symbol characters in accordance with the error correcting code and for generating the first check characters and the second check characters as defined in the forward error correcting code.

15. An electronic identification system including:  
 an interrogator for transmitting a first radio frequency interrogation signal;  
 a plurality of radio frequency transponders;  
 each transponder being operative in response to the interrogation signal to respond with a forward error correctable data message including base data in the form of identification

code data for the transponder encoded as a first set of symbol characters in accordance with a first forward error correcting code, a first set of check characters on the identification code data as defined in the first forward error correcting code, other base data encoded as a second set of symbol characters in accordance with a second forward error correcting code and a second set of check characters on the other base data as defined in the second forward error correcting code, for facilitating reconstruction of the identification code data and other base data in the event of corruption of the forward error correctable data message during transmission; and

the interrogator including

receiver means for receiving the forward error correctable data message; and

data processor means having data relating to the first forward error correcting code, the first set of symbol characters and the first set of check characters in the received forward error correctable data message; and further having data relating to the second forward error correcting code, the second set of symbol characters and the second set of check characters in the received forward error correctable data message, to reconstruct the identification code data and the other base data respectively, in the event of corruption of the received forward error correctable data message.

16. An electronic identification system as claimed in claim 15, wherein the first forward error correcting code and the second forward error correcting code are of different types.

17. A system as claimed in claim 15 wherein the interrogator is controllable to transmit the first and a second interrogation signal; wherein each transponder is operative in response to the first interrogation signal to respond with a first forward error correctable data message including the first set of symbol characters and the first set of check characters; wherein each transponder is further responsive in response to the second interrogation signal to respond with a second error correctable data message including the second set of symbol characters and the second set of check characters; and

wherein the data processor means is programmed to utilize the data relating to the first error correcting code, the first set of symbol characters and the first set of check characters in the received first forward error correctable data message to reconstruct the identification code data in the event of corruption of the received first forward error correctable data message; and wherein the data processor means is further programmed to utilize the data relating to the second error correcting code, the second set of symbol characters and the second set of check characters in the received second forward error correctable data message, to reconstruct the other base data in the event of corruption of the received second forward error correctable data message.

18. A transponder for use with an electronic identification system including an interrogator for transmitting a radio frequency interrogation signal and for receiving a response signal from the transponder, the transponder including control means; and a data memory arrangement into which is programmable data associated with the transponder; the control means being operative in response to an interrogation signal to utilize the data associated with the transponder to cause the transponder to respond with a forward error correctable data message including base data relating to the transponder encoded as symbol characters in accordance with a forward error correcting code; and check characters on the base data as defined in the forward error correcting code, for facilitating reconstruction of the base data in the event of corruption of the forward error correctable data message during transmission; and the forward error correcting code is a Reed-Solomon code.

19. A transponder as claimed in claim 18 wherein the data memory is configured to be programmed with the forward error correctable data message as pre-generated by an external code generation means for storage therein; and wherein the control means, in

use, utilizes the stored forward error correctable data message to respond to the interrogation signal.

20. A transponder as claimed in claim 18 wherein the data memory arrangement is configured to be programmed with the base data; wherein the transponder includes local code generator means for locally generating the forward error correctable data message by encoding the base data as symbol characters in accordance with the error correcting code and for generating the check characters on the base data as defined in the forward error correcting code; and wherein the control means, in use, utilizes the locally generated forward error correctable data message to respond to the interrogation signal.

21. A method of operating an electronic radio frequency identification system including an interrogator and at least one transponder; the method including the steps of:

- causing an interrogation signal to be transmitted by the interrogator;
- causing the transponder to respond to the interrogation signal with a forward error correctable data message including base data encoded as symbol characters in accordance with a Reed-Solomon forward error correcting code and check characters on the base data as defined in the Reed-Solomon forward error correcting code, for facilitating reconstruction of the base data in the event of corruption of the forward error correctable data message during transmission;
- receiving the forward error correctable data message; and
- causing an error correction means to utilize data relating to the Reed-Solomon forward error correcting code, the symbol characters and the check characters in the received forward error correctable data message, in order to reconstruct the base data in the event of corruption of the received forward error correctable data message.